

## Tutorial Checklist for SMT Shifters

The aim of this checklist is to introduce a new strategy for SMT shifter training. The new system is designed so that a new shifter will become more accustomed with the standard tasks they have to do during a shift.

Instead of the traditional two shadow shifts, the shifter is required to have an orientation shadow shift that introduces the SMT and the shifter tools. This is followed by additional time in the control room to perform listed tasks. Commonly a new shifter will not see a begin or end of store during their two shifts, and so the first time a shifter has to perform a begin store transition is during their first solo shift. In order to avoid this, this task list was compiled for all new shifters to complete before their first solo shift. It is the responsibility of the shifter to find beam conditions/transitions so that they can complete actions not done during their scheduled shadow shift.

The checklist is list of tasks that covers almost all actions a shifter should be able to fulfill after this training. If a shifter finds additions or corrections, please email kirby@fnal.gov or lucian@fnal.gov so that the errors can be fixed. During the training they are asked to go through Checklists 1-5 once with the guidance of the regular shifter. We strongly recommend the trainee to read the D0 SMT Shift Instructions before his training. All the page references in this document are to the D0 SMT Shift Instructions v1.43. ([http://d0server1.fnal.gov/projects/silicon/www/shiftinstructions/shift\\_instr\\_1.43.pdf](http://d0server1.fnal.gov/projects/silicon/www/shiftinstructions/shift_instr_1.43.pdf))

At the end of the checklist, the shifter will have earned their SMT Shifter merit badge.

### 1. INTRODUCTION

We ask the shifter to show and explain the trainee the following components of the SMT monitoring system. Several of the GUIs and monitoring need special attention and requested task are described below.

- GUI Starter: the place to start all other GUI's (p. 40)
- SMT Download GUI (explanation of downloading HDI) (p. 60)\*
- SMT DVDD Current GUI (color scheme, pulsars) (p. 42)
- IB Power Supplies GUI (p. 47)
- SEQ Power Supplies GUI (p. 48)
- IB temperature GUI (p. 49)
- Read Out Crates IOC's (p. 55)
- Global HV Monitoring GUI (p. 90)
- Channel HV Monitoring (p. 95)
- HV Alarms & Alarms display (p. 100, 113)
- SMT Event Display (p. 119)
- SMT examine (p. 124)
- STT examine
- Data integrity GUI (p. 167)
- Occupancy GUI (p. 143)

- Online Monitoring (p. 29)
- Radiation Alarm (p. 171)
- Who and how to page (SMT pager, STT pager, Radmon pager) (p.172)

1.1. **SMT Download GUI.** The shifter should know how to:

- download an entire crate (p. 64), a VRB (p. 19), a Sequencer (p.20), a Sequencer channel(p. 20), and an HDI (p. 20).
- print HV pod information of an HDI \*
- power off HDI (p.24)
- enable and disable an HDI \*
- start monitoring in crate (p. 30)
- validate download parameters (buffer conf, sparse vs read all, 16x2K vs 8x4K buffers) (p.15) \*

1.2. **SMT DVDD Current GUI.** The shifter should know how to:

- decipher the status color code (esp. tripped HDI)(p.16)
- be able to get the crate and HDI name for redownloading tripped HDI (p.18)
- understand the function of the pulsers and how to control (e.g. if the pulsers are started with a download GUI, and this GUI is then closed, the pulsers will turn off)(p. 17)

1.3. **HV Monitor.** The shifter should be able to:

- evaluate the Tevatron state with the aid of the Shift Captain to decide appropriate HV state
- ramp up and down HV (p.94)
- reset a pod trip (p.103)
- monitor HV current and voltage in StripTools (p. 110)

1.4. **Start and Stop Examines.**

- SMT Examine
- STT Examine
- Occupancy GUI
- Data Integrity GUI

## 2. BEGINNING OF SHIFT

The training shifter should go through the Beginning of the Shift checklist in the Logbook with the new shifter. The shifter should pay attention to the following

- Logging into the logbook:**
- The trainee should have his own username and password to use for the logbook (if not ask the DAQ shifter to create one)
  - Explain how the logbook works
  - Explain the memory problem of the logbook. (Solution: close and open the Logbook)

**Monitoring GUIs:** explain what the trainee should look for when looking at this GUIs

**Checking the archivers:** archiver check script (p. 160, p. 165)

**STT Check:** Making sure to explain the STT Alarm GUI and the Solenoid Polarity GUI and how to restart if the connection has been lost.

**Walkthrough:** Show the SMT VRB crates in MCH 2.

### 3. SHOT SETUP, BEGINNING OF STORE

The trainee should be present once when a new store is declared. The training shifter should give guidance while the trainee completes the Shot Setup and Beginning of Store checklists.

**SMT download :** explain how to download all chips and checking that the right parameters values are used. (p15)

**Ramping up the voltage:** Explain when and how the HV is ramped up (p.89, 94)

**Restart Examines:** SMT, STT, occupancy, and data integrity. Trainee should understand difference between all, zero bias, and special parameters for examines.

**SMT Radiation Alarm:** The shifter should understand the difference between the alarm and abort levels, and who to page.

### 4. END STORE

The trainee has to learn how to ramp down the HV (P.89, 94) and has to be present once at an end of a store. The shifter should explain when and how to ramp down the voltage. Special attention will be given to monitoring of the Channel HV monitor in order to check that all voltages are under 5 V.

### 5. DATA TAKING

The shifter will go through the Begin of Run, Data taking, and End of Run checklists with the trainee. The shifter will also show the trainee how to save the SMT and STT plots. We ask that under the shifter supervision the trainee complete the Logbook Data Taking Checklist at least 2 times. Special attention should be given to

**Tripped HDI:** No intervention until end of store if not halting DAQ, but must be reported in the logbook.

**Minor Alarms concerning the bias current:** Trainee know how to raise I<sub>max</sub> value by 10 $\mu$ A and when to page expert for rapidly rising currents. (p. 27)

## 6. SHIFTER SIGN OFF

| 1.Checklist                      | Date | Time | Shifter | Observations |
|----------------------------------|------|------|---------|--------------|
| 2.Introduction                   |      |      |         |              |
| 3.Beggining of shift             |      |      |         |              |
| 4.Shot Setup, Beginning of Store |      |      |         |              |
| 5.End Store                      |      |      |         |              |
| 6.Data Taking                    |      |      |         |              |